

# PATENT SPECIFICATION

697.071



Date of Application and filing Complete Specification: Jan. 8, 1952.

No. 552/52.

Complete Specification Published: Sept. 16, 1953.

Index at acceptance:—Class 87(ii), A1(i2x: r6), A2(a3: b2), A2h(1:4).

## COMPLETE SPECIFICATION

### Improvements in Flexible Moulds for Casting Settable or Hardenable Plastic Substances for example Jellies, Sugar Masses or Fondant Centres

I, ROBERT SOLLICH, of Volkhausenstrasse No. 10, Bad Salzungen, Germany, of German Nationality, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to the manufacture of moulded articles from hardenable or settable plastic materials, more especially jellies or sugar masses and preferably for the manufacture of fondant centres and the like, and has for its object the provision of an improved flexible mould construction of the type in which ejection of the finished product from the mould is effected by deformation of the resilient mould to change the mould volume defined by the wall parts which impart the form to the article.

When flexible rubber moulds assembled in plate form are used, more bending up of the mould plates when inverted has in many cases heretofore been considered to be an adequate method of freeing fondant centres from the mould cavities. Other previous constructions have employed rigid sheet-metal moulds lined with a rubber lining or membrane which was held in close contact with the internal moulding surfaces of the moulds by suction during the casting or filling operation and caused to be separated from the moulding surfaces, e.g. by releasing the suction and applying pressure, in order to eject the superficially hardened fondant centres.

In order to reduce the number of rejects and to avoid, as far as possible, the numerous mishaps which may occur when the means described above are used for the ejection of such relatively fragile

articles as fondant centres, it is proposed according to the present invention to provide the casting mould body or mould profile with an outer edge or rim portion and a bottom portion both of which retain their shape i.e. are non-deformable, and with a resiliently yielding wall part lying between and connecting the rim and bottom portion.

Thus, the opening or mouth of the mould and also the mould bottom, both of which determine a substantial part of the outer shape of the article to be manufactured, do not deform during the ejection operation, which comprises flexing the resilient wall part between the rim and the bottom, so that the liability of the article to damage is reduced, particularly in the case of fondant centres and the like in which, at the time of ejection, the inside is still soft.

For the improved mould according to the present invention, a normal flexible (e.g. rubber) mould can readily be used but in order to obtain the necessary retention of shape in the rim and bottom portions, the mould is provided with metal reinforcement members to give the desired rigidity; such reinforcement may be sheet-metal, wire or shaped section and the like appropriately located in the regions in question.

For combining a plurality of flexible moulds to form a set or group, according to the invention, multi-mould metal frames forming individual longitudinally extending beams are used to which the flexible moulds can be secured (e.g. by vulcanising in the case of rubber) during the manufacture thereof. Further according to the invention, an alternative way of making up sets of moulds consists in sliding the moulds

into a supporting frame, which encloses them externally and longitudinally, so that they form a row therein, the moulds being attached to the frame by means of a tongue and groove arrangement so that they can easily be removed and replaced.

For obtaining a large output the moulds are combined into such longitudinally extending beams and are formed into an endless chain of casting moulds in known manner in an automatic depositing machine.

The construction of the individual mould and also that of a whole set or group of moulds is extremely simple if, according to the invention, they are made up in the form of a sandwich of a pair of flat relatively rigid plates between which a resiliently deformable layer, e.g. rubber is interposed.

The ejection of the individual moulded articles, e.g. fondant centres, from moulds combined into an endless chain is most advantageously effected, according to the invention, by arranging inwardly of the lower, i.e. returning, lap of the chain an ejection device, which may conveniently be in the form of a pressure strip or pressure roller, which acts on the bottoms of the inverted moulds.

By way of example, some embodiments of casting moulds according to the invention, and a diagrammatic illustration of an apparatus for manufacturing confectionery centres, are shown in the accompanying drawings, in which:

Figure 1 is a cross section through one embodiment of a casting mould,

Figure 2 is a similar cross section, but showing a stronger supporting frame which is wholly incorporated into the body of the mould,

Figure 3 is a longitudinal section through a set of moulds combined together to form a longitudinally extending beam; the individual moulds being according to Figure 2,

Figure 4 is a plan view of the beam arrangement of Figure 3,

Figure 5 is a cross section of a casting mould built up from a plurality of flat plates or layers,

Figure 6 is a cross section showing a longitudinal supporting frame externally enclosing a set of moulds adapted to be slid into the frame,

Figure 7 is a longitudinal diagrammatic section through an apparatus for manufacturing confectionery centres showing means for ejecting the centres according to the invention,

Figure 8 is the plan of a built-up mould plate, and

Figure 9 is a cross section through the

mould plate.

From the drawings it can be seen that all embodiments of the casting moulds, which for example are made substantially of rubber, have a common feature, namely the interposition of a resilient annular wall part between the rigid outer edge or rim of the mould and the bottom which is also rigid. In the embodiments of the casting moulds 1a, 1b and 1c according to Figs. 1, 2 and 6, the main bodies of the casting moulds are made of rubber stiffened where necessary as described hereafter, whereas in the embodiment according to Figure 5 only an intermediate layer 11 consisting of a resiliently flexible rubber sheet or lamina is used and the top and bottom layers 9 and 10 consist of a relatively non-deformable substance, such as, for example, a thermo-plastic resin.

In the embodiment of Figure 5, the non-deformable layers 9 and 10 ensure sufficient shape-retention to permit uniform ejection to be achieved by compression of the resilient intermediate layer 11. In the embodiments of Figures 1 and 2 the rigidity of the rim or outer edge 2 of the mould 1 is obtained by means of stiffening metal reinforcement 5 such as sheet-metal, wires or shaped sections as illustrated. The bottom 4 of the mould 1 also may be reinforced, as shown in Figures 2 and 3, by a rigid plate 4a of sheet metal or other suitable material vulcanised on to it, so that the mould bottom also retains its shape. Between the rigid rim or outer edge 2 and the shape-retaining bottom 4 the walls 3 of the rubber mould 1 are relatively thin and flexible, being formed as a resiliently yielding annular wall, whereby the deformability of the mould for ejection purposes resides only in the wall 3, the shape of the other parts being in no way impaired thereby. The reinforcement of the mould bottom 4, where such is of rubber, may alternatively be effected by making the cross section of the bottom particularly thick, i.e. by aggregation of material, to provide an adequate degree of rigidity (see Figure 6).

The embodiment according to Figure 6 facilitates the removal of the rubber moulds 1c from, and their replacement in, the supporting frame 7 which encloses them for the purpose of combining a plurality of moulds into a longitudinally extending beam in the manner shown in Figure 3. The moulds 1c can be slid into the frame members 7 with a tongue and groove attachment 12 to provide inter-engagement.

In the embodiment according to Figures 1, 2 and 3, such removal and

replacement is not generally feasible because in those embodiments the rubber moulds 1a and 1b are vulcanised into the metal frames 6 (see Figures 3 and 4) which are provided with mould holes 1d and also with the side members 5 which are shown in cross section in Figures 1 and 2. Figures 3 and 4 show the metal frames 6 to be formed integrally with the side members 5 so as to have a channel-shaped cross section to increase the moment of resistance and having the holes 1d spaced along the "web" part thereof.

Figures 8 and 9 show construction of a mould plate 13 made up of a plurality of individual moulds assembled on a frame 6a in similar manner to that in which the beam shown in Figure 3 is formed.

In the diagrammatic illustration of the fondant-manufacturing apparatus shown in Figure 7, the arrangement is as follows: the moulds 1 which may be of any of the forms 1a, 1b or 1c as shown in Figures 1, 2, 4 and 5, are formed into beams 14 (e.g. as illustrated in Figures 3 and 4) which in turn are linked together as an endless conveyor 8. The moulds are filled from a hopper depositor 15 and pass along a horizontal run 16, where they are subjected to cooling air from a blower 17, and a further cooling run 18 in which they are inverted. At the end of the run 18 the moulds reach an ejection device 19 (for instance a displaceable pressure strip or a pressure roller) actuated in timed relation to the arrival of the mould at the ejection station. The ejector device 19 causes the moulds to be deformed at the intermediate part 3, causing the fillings to fall out onto a discharge conveyor 20 moving in the opposite direction towards, for example, a coating or enrobing device 21. The empty moulds pass back to the charging or casting station, being cleaned and dusted by means of a device 22 also actuated in timed relation to the movement of the moulds.

It is to be understood that where in this specification rubber is referred to, synthetic rubber or rubber substitute are equally applicable.

What I claim is:—

1. A mould device made of flexible material such as rubber, for the manufacture by casting of moulded bodies from settable or hardenable plastic substances, more especially jellies or sugar masses and preferably for the manufacture of

fondant centres, wherein the mould body or mould profile is provided with an outer edge or rim and a bottom portion which are substantially shape-retaining and non-deformable, and with a resiliently yielding wall part between and connecting the edge or rim and the bottom portion, whereby deformation of the mould for ejection purposes is substantially confined to the resiliently yielding wall part.

2. A mould device according to claim 1, wherein the main body of the mould is of rubber and its edge or rim and bottom portion are stiffened with metal reinforcements such as sheet-metal, wires, or shaped sections.

3. A device wherein a plurality of individual moulds according to claims 1 or 2 are assembled into a composite multi-mould structure comprising a metal frame to which the moulds may be vulcanised, the multi-mould structure being preferably in the form of a longitudinally extending beam.

4. A device wherein a plurality of individual moulds according to claims 1 or 2 are assembled into a composite multi-mould structure comprising a metal frame into which the moulds can be inserted individually and secured by a tongue and groove attachment, the frame supporting and enclosing the moulds longitudinally and externally.

5. A casting apparatus wherein a plurality of the beam frames according to claim 3 are united in parallel to form an endless casting-mould chain.

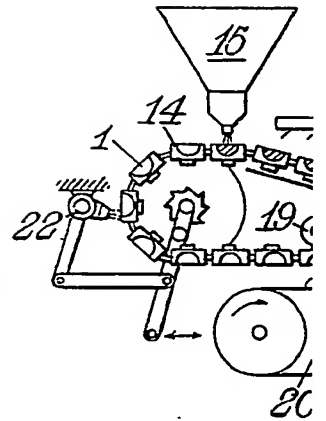
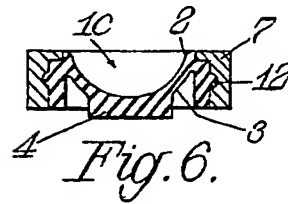
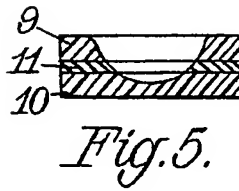
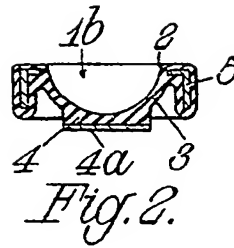
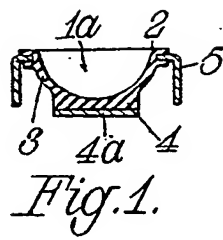
6. A device wherein the moulds according to claims 1, 4 or 5 are composed of a pair of non-deformable shape-retaining plates between which a resiliently deformable plate, for instance of rubber, is interposed.

7. A casting apparatus according to claim 5, wherein an ejection device, for instance a pressure strip or pressure roller, is operatively associated with the lower run of the mould chain to act on the bottoms of the moulds for ejection purposes.

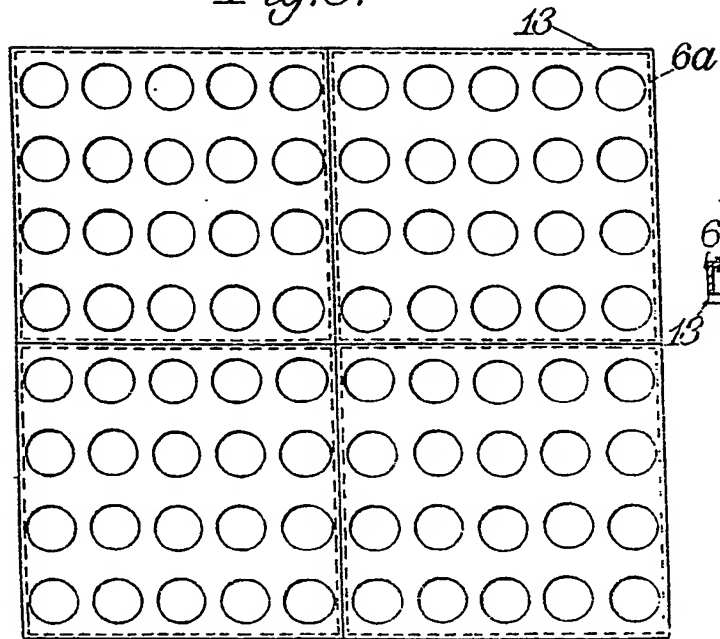
8. Mould devices for the manufacture by casting of moulded bodies from hardenable plastic substances, more especially sugar masses and preferably for the manufacture of fondant centres, substantially as described with reference to the accompanying drawings.

MARKS & CLERK.

Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press.—1953  
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.



*Fig. 8.*



*Fig. 9.*

